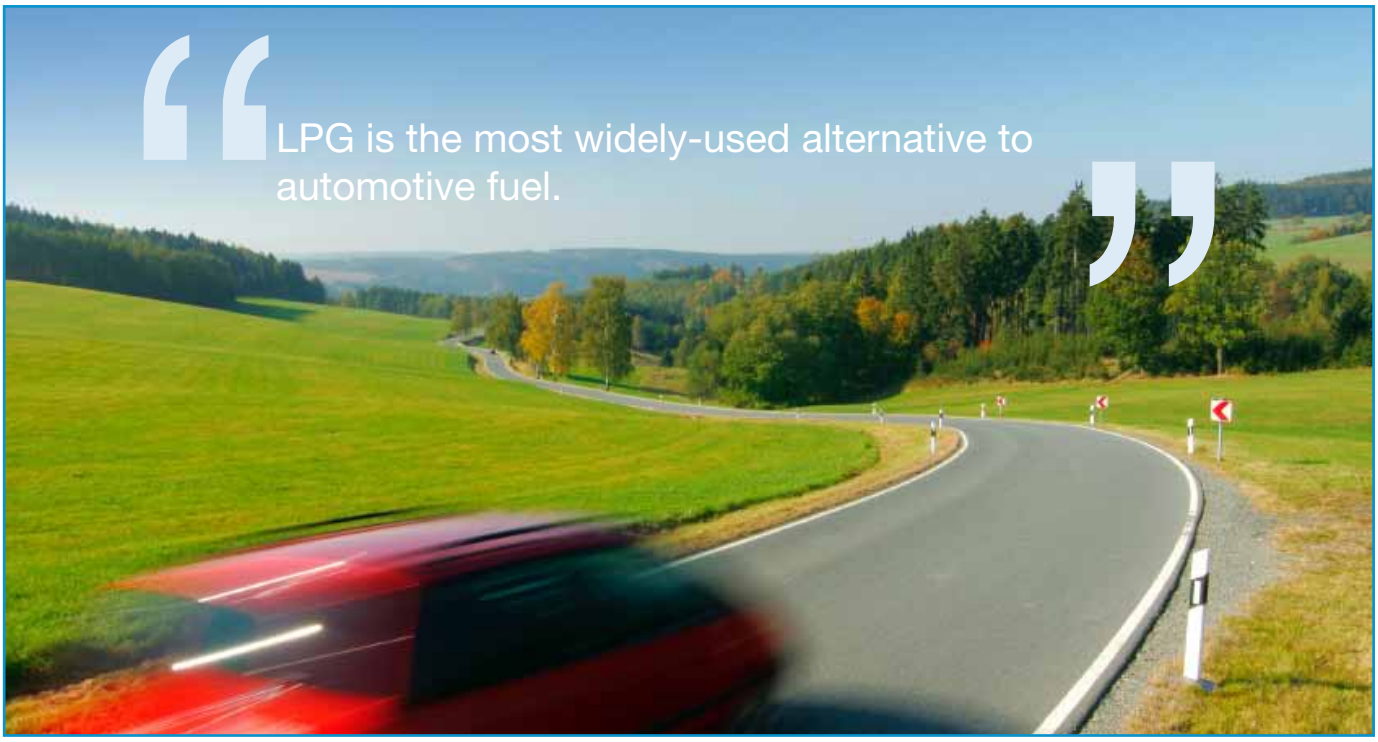
Exceptional Energy – Fact Sheet

LPG
EXCEPTIONAL
ENERGY

LPG is an exceptional energy source due to its origin, benefits, applications and its industry

With an immediate and global availability, environmental benefits, its natural by-product origin, transportation flexibility and diverse application, LPG plays a pivotal role in the transition towards a more secure, sustainable and competitive energy model.

Liquefied Petroleum Gas (LPG) is a clean-burning and efficient fuel and a vital source of energy for hundreds of millions of people throughout the world today. It is a modern and safe energy providing heat and power to both urban and rural consumers. LPG can be used anywhere and is available now without large investments in technology and infrastructure. It is a multi-purpose energy with literally thousands of applications. It is portable; can be transported, stored and used virtually anywhere in the world and there are sufficient reserves to last for many decades. Importantly LPG demonstrates lower GHG emissions than petrol, diesel, and electricity, on an energy-equivalent basis.



Origin

LPG is a naturally occurring by-product of natural gas extraction (60%) and crude oil refining (40%) – therefore we either use it or it is wasted.

LPG is primarily a combination of propane and butane molecules, along with trace amounts of other compounds. In the past LPG was destroyed through venting or flaring (i.e. the burning off of unwanted gas), wasting the full potential of this exceptional energy source. At a normal temperature, LPG is a gas. When subjected to modest pressure or cooling, it transforms into a liquid which is easy to transport and store.

Applications

There are more than 1000 applications of LPG. It is also the most widely-used alternative to automotive fuel.

Hundreds of millions of people currently use LPG and depend on it for thousands of applications, in commercial business, in industry, transportation, farming, power generation, cooking, heating and for recreational purposes.

LPG is used throughout the home, as a gas to cook with, a source of fuel for central heating and hot water. LPG provides a multi-purpose and reliable energy supply, making it widely used in hotels and restaurants.

LPG is commonly used in the agricultural sector for thermal desiccation, crop-drying, fuelling of farm vehicles and insect repellent. As a modern and environmentally friendly energy source, LPG can play an integral role in the ongoing development of agriculture.

LPG is also the preferred alternative automotive transportation fuel. Autogas is today the most accepted alternative fuel in the automotive sector with more than 13 million vehicles operating worldwide. The added value of LPG as an automotive fuel is that it generates considerably fewer emissions than other fossil fuels, contributing to the protection of the environment and human health while also mitigating the threat of climate change.

LPG's flexibility and environmentally friendly characteristics make it an ideal fuel for recreational applications, both on land and on water. From assisting people while camping and powering a barbecue to fuelling leisure-crafts and hot air balloons.

Benefits

> LPG is an exceptional energy source because of its benefits to consumers, industry and the environment

LPG is a clean energy source

LPG produces less air pollutants than diesel, oil, wood or coal

The quality of local air can have a serious impact on human health, plants, animals and even buildings. Transport, 'stationary combustion' (cooking and heating) and power generation are the primary sources of local air pollution. LPG can make a positive contribution to air quality improvement compared to diesel, heating oil and solid fuels.

Looking at its carbon footprint – the sum of its greenhouse gas emissions - LPG is one of the cleanest conventional fuels available. Originating mainly from natural gas production, LPG is also non-toxic and has no impact on soil, water and underground aquifers.

The LPG industry is well placed to provide solutions to improving local air quality, from encouraging the uptake of autogas and hybrid engines in the automotive sector to assisting developing nations to help their populations switch from wood and kerosene to LPG for their cooking and heating needs.

Road-transport vehicles are an important source of both air pollutants and climate-destabilising greenhouse gases. There is clear evidence of the harmful impact on human health of exposure to vehicle pollutants. As a result, local air quality has become a major policy issue in almost all countries.

Autogas offers an immediate, concrete solution to improve air quality especially in urban areas. In terms of airborne emissions of the principal regulated noxious gases, autogas is among the lowest of all automotive fuels available today. According to authoritative scientific testing, autogas yields 50% less carbon monoxide (CM), 40% less hydrocarbons (HC), 35% less nitrogen oxides (NOx) and 50% less ozone forming potential compared to gasoline. CO_2, NOx and HC emissions contribute to the creation of ground-level ozone and photochemical smog, and Particular Matter (PM) is a known carcinogen and contributor to respiratory problems. In addition, switching to LPG reduces the amount of soot –

also known as Black Carbon (BC) – being emitted from cooking stoves in villages around the world. Therefore, the health benefits from LPG are significant.

LPG is a lower carbon energy source

LPG emits about 20% less CO_2 than heating oil and 50% less than coal

As a low-carbon, low-polluting fossil fuel, LPG is recognised by governments around the world for the contribution it can make towards improved indoor and outdoor air quality and reduced greenhouse gas emissions.

LPG produces lower greenhouse gas emissions compared to conventional energy supplies in every application it is used, from stationary applications such as water heating, space heating, cooking and industrial boilers to transportation applications. Any industry can switch to clean-burning LPG as a means to meet greenhouse gas targets.

Studies consistently demonstrate that LPG generates fewer carbon emissions than gasoline (petrol) and broadly equivalent emissions to diesel. In addition the carbon footprint of LPG is 20% lower than that of fuel oil and 50% lower than coal.

Autogas can play an important role in mitigating climate change. It has among the lowest greenhouse gas emissions of all commercially available fuels, when measured over its full life. LPG offers the lowest well-to-wheel greenhouse gas emissions per 100 kilometres driven of all the fuels analysed – lower than petrol and diesel in almost every region and 12% lower than corn-based ethanol (E85) in North America. In Japan, autogas generates 30% lower greenhouse gas emissions than petrol and 33% lower emissions than diesel.

LPG is an efficient energy source

LPG was found to have higher efficiency than natural gas fuelled distributed power generation which makes it ideal for rural homes and businesses

As a cost-effective energy source, LPG can be up to five times more efficient than traditional fuels, resulting in less energy wastage and better use of our planet's resources.

LPG is an energy-rich fuel source with a higher calorific value per unit than other commonly used fuels, including coal, natural gas, diesel, petrol, fuel oils, and biomass-derived alcohols. This fact means that an LPG flame burns hotter, an advantage that can translate into higher efficiency.

LPG is extremely versatile and portable. It can be transported using sea, rail or road transport. LPG is available in a wide variety of packaging and storage options ranging from refillable cylinders to underground tanks.

It is also a fuel that is available in even the remotest of areas, improving the lives of millions of citizens worldwide and providing a further impetus to regional development.

As relatively few of the rural areas or remote areas can benefit from piped natural gas, LPG is an ideal power source for rural areas and for population living in remote areas, either as a primary source or in combination with renewable fuels.

As LPG originates from many different parts of the world and has a flexible supply chain, it drastically reduces dependency only on one source.

LPG does not need a huge infrastructure of pipelines to support it. Often, it is the only fuel to reach islands or high altitude communities and, in times of emergency or national disaster, it can be crucial to survival.

In developing rural communities, LPG can provide a first modern alternative to traditional cooking fuels (e.g. firewood, charcoal, dung), contributing to a better quality of life and importantly, liberating women and children from time spent collecting fuel, thus enabling them to pursue education or value-added economic activities within the community.

LPG is an innovative energy source

LPG helps to reduce emissions of a typical house by 1.5 tonnes (around 25%) of CO_2 per year

As one of the cleanest conventional fuels available, LPG complements renewable energy sources and technologies which depend on the weather or daylight. LPG also enables decentralised generation through small self-containing generators and micro combined heat and power.

Industry

The LPG industry is characterised by its diversity and competitiveness. It is devoted to having the highest safety standards, while being committed to improving people's standard of life. In addition, the LPG industry is equipped to immediately contribute to a sustainable energy mix anywhere and anytime. It is committed to meeting the world's energy challenge and helping meet the world's energy needs while stabilising CO_2 emissions.